UNIVERSITY OF BIRMINGHAM

WM-Air Impact Case Study

Improving air quality for the people of the West Midlands

First West Midlands-wide Air Quality Framework

Actions to improve air quality for **2.9m** residents and reduce ca. **2300** early deaths/year attributed to air pollution across the region

Commitment of ca. **£1.5m** to support measures identified

Three positions created to support the development and implementation of the Framework

Effective Collaboration + Co-creation - with WMCA

Policy + Legislation – new framework

Economic - jobs created, investments influenced

Capacity building - CPD and networks

Health + Wellbeing – reducing mortality and morbidity

Practise - new governance structure for framework

WM-Air and WMCA co-created the first West-Midlands-wide air quality framework to improve air quality for the 2.9m residents. This AQ framework was approved in Nov 2023 and is now supporting actions to improve air quality across the region via a suit of funded-activities. These included a £1m Defra AQ grant to deploy at network of AQ sensors across the region and support a behavioural-change programme, and funding to explore the possibility of adopting a 'stretch target' for regional air quality improvements that would see reductions in pollutants ahead of those identified by UK government.

Background - why does this work matter?

In the West Midlands, action to improve air quality has historically been delivered by the seven constituent local authorities that make up the WMCA (Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall and Wolverhampton) and Transport for West Midlands (TfWM), in a fragmented manner, with the work mainly focused on delivery of Air Quality Action Plans (as required by Defra) and reduction of emissions from transport.

In June 2021, air quality was raised as an issue at the WMCA annual meeting and questions were asked as to whether the region could do more, going beyond transport emissions alone. This work was subsequently passed to the WMCA Environment Team – and at that point, there was no technical air quality expertise within the team.

Method – what did we do?

In 2021, building on dialogue involving the NERC-supported WM-Air project, WMCA began developing an AQ framework, with WM-Air developing the initial 'options paper' to scope opportunity/return for the region.

WM-Air undertook the following (via Impact Fellow secondment to WMCA):

1. Worked with stakeholders at WMCA, TfWM and LAs to identify effective potential actions to improve AQ and health, and areas not covered by prior local AQ strategies.
2. Provided expert commentary and a series of briefings to groups of elected members/officials to develop understanding and political/ technical buy-in.
3. Brought together an evidence base to support a future AQ strategy with 3 main foci:
   - Establishing the health impacts of poor AQ in the West Midlands;
   - Quantifying the health/healthcare economic benefits of AQ measures under consideration;
   - Exploring issues impacting AQ neglected in current strategies (including place-based environmental inequality across the region);

Following-on from consideration of the Options Paper by the WMCA Board (11 Feb 2022), a fully-costed AQ Framework was developed, through collaboration with WSP (environmental consultancy) working closely with WM-Air for input, advice, guidance.

What tools/outputs were developed?

- AQ Options Paper
- AQ Framework

Both documents included input from WM-Air tools and models, such as the high-resolution ADMS-Urban air quality model (and scenarios) and the Air Quality-Life-course Assessment Tool (AQ-LAT).

- AQ Literacy Training

Outcomes, Impacts and Benefits delivered

The West Midlands AQ Framework and Implementation Plan [2] was formally approved by WMCA board on 17 November 2023. This provides, for the first time, a region-wide Framework to improve AQ for 2.9m residents and reduce ca.2300 early deaths/year attributed to air pollution across the region [3]. The Framework built on potential actions identified in the options paper, using WM-Air AQ and healthcare economic modelling to underpin the case for action.

Following the development of the Framework, WM-Air supported WMCA in:

- Securing a £918k Defra AQ grant to deploy at network of AQ sensors across the region and supporting a behavioural-change programme
- Securing a £500k capital grant from DLUHC to expand this network
- A further £370k has been committed by WMCA to support the implementation of the Framework
- Three positions were created at WMCA to support the development and implementation of the Framework
- Development of an AQ literacy programme for politicians / officers to

"The reality is, that very little of this would have been possible/achieved without the support from WM-Air. The work on air quality has been accelerated significantly because of the investment of time and resources from the programme. The Impact Fellow role has been of critical importance in the development of the air quality work, providing trusted support and input to the development of policy and strategy."

Jackie Homan, Head of Environment, WMCA

Won 2024 UoB Impact Award for 'Outstanding Impact on the Environment'.

WM-Air membership of the WMCA AQ Framework Steering/Implementation Group.

> "The work of the WM-Air Team has helped us to understand the sources of this air pollution and has provided a vital evidence base that we have been able to use to secure significant grant support – a total of just under £1.5m from Defra and DLUHC."
>
> **Andy Street, Major of the West Midlands**

About WM-Air: Clean Air Science for the West Midlands

WM-Air ("Clean Air Science for the West Midlands") is a NERC-funded initiative, led by the University of Birmingham, working in collaboration with over 20 cross sector partners, to apply environmental science research expertise to improve air quality in the West Midlands, delivering health, economic and environmental benefits.

wm-air.org.uk

Partners

UKRI Natural Environment Research Council

West Midlands Combined Authority

WSP

increase knowledge and awareness of AQ (i.e., moving away from thinking air pollution is purely a transport issue).

Looking to the Future/Legacy

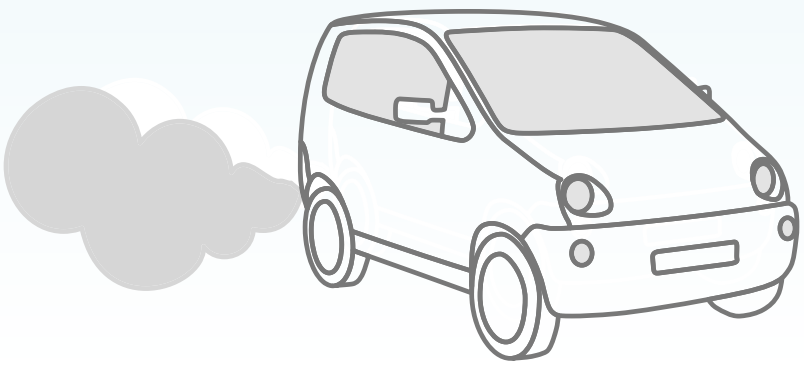
WM-Air continues to work closely with WMCA on the Framework Implementation. Ongoing actions include:

- Formal governance through membership of the Implementation Advisory Group.
- Deployment of the UoB Mobile AQ Supersite to investigate pollution hotspots.
- Hosting WMCA sensors at the UoB AQ Supersite for validation and calibration.
- Providing quarterly commentary on AQ in the region.
- Using modelling tools to assess scenarios for future emissions.
- Auditing sensor and modelling capacity across the West Midlands.

Underpinning Science

The Initial AQ options paper and subsequent AQ Framework and Implementation plan developed from research brought together by the NERC funded WM-Air programme at the University of Birmingham:

- The principle of "Reduce-Extend-Protect" to describe and prioritize strategies for reducing exposure to air pollutants was used in the options paper (Hewitt et al., 2019)
- Local air quality modelling (Zhong et al., 2021) was used to describe the current air quality situation in the West Midlands in both the options paper and the Air Quality Framework
- A regional scale air quality model developed through the WM-Air programme (Mazzeo et al., 2022) was used in the options paper to demonstrate the impact of reductions in ammonia emissions from agriculture and particulate emissions from wood burning in the West Midlands region
- The health impact of air quality in the region was assessed using the WM-Air AQ-LAT tool (Hall et al, 2024)
- A source apportionment study carried out by WM-Air (Srivastava et al., 2024; in prep) was used in the Air Quality Framework to highlight the importance of action to address the use of solid fuels
- The Climate Risk and Vulnerability Assessment developed by WM-Air (Greenham et al., 2023) provided a case study in the Framework on the public health impacts of air pollution in the West Midlands
- EADR analysis of real-world vehicle pollutant emissions (Omid Ghaffarpasand et al., 2020) by WM-Air was highlighted in the Framework as directly contributing towards the achievement of option MON6.



More info: